L 38525-65

ACCESSION NR: AP5005290

small number of atomic layers by the field is described in detail. It was ob-
served that a "bridge" is formed spontaneously, followed by recrystallization ac-
companied by resumption of the continuity of the microcrystal. Similar recrystal-
lization at low temperature within a relatively short time interval was observed
in iron and nickel after low-temperature deformation (Garber et al, DAN SSSR v.
110, 64, 1956; FTT v. 2, 1096, 1960). The recrystallization is apparently accom-
panied also by relaxation of the stresses, thus causing an appreciable disordering
of the crystal. The results seem to confirm the author's earlier hypothesis.
Orig. art. has: 2 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR, Khar'kov (Physicotechnical
Institute, AN UkrSSR)

SUBMITTED: 28Jul64   ENCL: 00   SUB CODE: SS

NR REF SOV: 006   OTHER: 002

Card 2/2

L 00734-66   EWT(m)/T/EWP(t)/EWP(b)/EMA(c)   JD

ACCESSION NR: AP5022700

AUTHOR: Garber, R. I.; Soloshenko, I. I.; Khaldey, O. A.

UR/0181/65/007/009/2655/2659

TITLE: Relaxation of critical stresses of motion and critical stresses of multiplication of dislocations with repeated bending

SOURCE: Fizika tverdogo tela, v. 7, no. 9, 1965, 2655-2659

TOPIC TAGS: lithium fluoride, sodium chloride, plastic deformation, bend test, bending stress, stress relaxation

ABSTRACT: Critical stresses of multiplication and motion of dislocations are studied in lithium fluoride and sodium chloride specimens as functions of the number of loading cycles, the temperature and the loading method. It is found that there is a reduction in the critical stress with an increase in the number of cycles. For LiF, one-time loading is associated with a stress of 600, ten times loading with 250, and 100 times with 70 $g \cdot mm^{-2}$. The corresponding values for NaCl are 300, 150 and 50 $g \cdot mm^{-2}$. Mechanical strength increases with the number of cycles. This is shown by a gradual reduction in the number of regenerated dislocations and by a decrease in the damping constant of elastoplastic vibrations. Holding in the unloaded state at room temperature for 150 seconds after each loading cycle complete-

Card 1/2

Card 2/2

BADEN, K.I.; OFLAN, I.A.; [illegible], I.L.; [illegible]

Hardening and dislocation structure of [illegible] fluoride crystals
loaded according to program. Tristallografiia 10 no.3:435-437
My-Je '65.   ([illegible] 18:7)

1. Khar'kovskiy fiziko-tekhnicheskiy institut.

L 26644-66   EWT(m)/T/EWP(t)   IJP(c)   JD

ACC NR: AP5025331   SOURCE CODE: UR/0126/65/020/003/0442/0447

AUTHOR: Garber, R. I.; Datsko, O. I.

ORG: Physical Engineering Institute, AN SSSR (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: Internal friction during alpha-gamma conversion of iron

SOURCE: Fizika metallov i metallovedeniye, v. 20, no. 3, 1965, 442-447

TOPIC TAGS: internal friction, iron, phase transition ,temperature dependence, carbon, plastic deformation, creep, metastable state

ABSTRACT: In iron with 0.03% carbon, the maximum on temperature dependence curves of low frequency internal friction was shown in the α-γ conversion range, which in proportion to the increase in deformation amplitude, shifted to the high temperature boundary of the range (from 860 to 890C). Thus the internal friction rose significantly. It was proposed that at low amplitudes (4.10^{-6}) the maximun was combined with friction in the interphase boundaries and at high amplitudes (8.10^{-5}), with losses in plastic deformation. It was found that the attenuation ratio of iron in the temperature conversion range was basically caused by temperature background, friction at the interphase boundaries and plastic deforma-

Card 1/2   UDC: 548.4

L 26644-66

ACC NR: AP5025331

tion losses. The plastic deformation losses during relative deformations in the order of 8.10^{-5} were very high and were observed in a wide temperature range, significantly exceeding the range of $\alpha - \gamma$ conversion of iron with 0.03% carbon. Losses in plastic deformation had maxima at the same temperatures as creep rate: 690° and 890° (end of polymorphic conversion of ferrite). The reduction in loss from plastic deformation as a result of decreased relative deformation of the specimen to 4.10^{-6} made it possible to locate the attenuation ratio peak in the 860° range, which may be combined with friction at the interphase boundaries. The gradual reduction of attenuation ratio in the γ-phase range over a period of $50-100^\circ$ apparently indicated the presence of metastable phases causing additional internal friction in the single-phase with respect to stable structure of the range. Orig. art. has: 3 fig.

SUB CODE: 11,20/ SUBM DATE: 09Jul64/ ORIG REF: 015/ OTH REF: 003

Card 2/2

L 8841-66   EWT(m)/T/EWP(t)/EWP(b)/EWA(c)   IJP(c)   JD/JG

ACC NR: AP5027148   UR/0126/65/020/004/0603/0607

AUTHOR: Garber, R.I.; Gindin, I.A.; Chirkina, L.A.

ORG: Physicotechnical Institute, AN UkrSSR (Fiziko-tekhnicheskiy institut AN UkrSSR))

TITLE: Low temperature "deformation" polymorphism in lithium by the internal friction/method

SOURCE: Fizika metallov i metallovedeniye, v.20, no.4, 1965, 603-607

TOPIC TAGS: lithium, phase transition, internal friction

ABSTRACT: Measurements were made by the method of damping free torsional vibrations of the samples in the temperature interval embracing the transition from a body-centered cubic lattice to a face-centered cubic lattice (78-200°K), at frequencies of 0.7, 0.8 and 1.3 cycles, in the region independent of amplitude. The logarithmic decrement of damping was taken as the measure of internal friction. The lithium samples, of a purity of 99.3%, were prepared by pressing in the mold at room temperature under a layer of kerosene for protection from oxidation. The length of the effective cylindrical section of each sample was 30 mm and the diameter 3 mm. For stress measurements, the sample was annealed for 2-3 days at 300°K, then pickled in methyl alcohol and

Card 1/2   UDC: 548.33:539.67

L 8841-66

ACC NR: AP5027148

cooled to the temperature of liquid nitrogen (78°K), at which temper-
ature it does not oxidize or undergo phase transition, and was mounted
in the apparatus for measurement of internal friction in the single
phase state (body-centered cubic). To induce the polymorphic transi-
tion from the body-centered cubic to the face-centered cubic lattice
and to investigate internal friction, part of the samples were previ-
ously deformed by torsion at 78°K up to the relative shear, 5.2×10^{-2}.
The martensite nature of the "deformation" nature of the transition
from a body-centered to a face-centered cubic lattice in lithium is
marked in an especially clear manner in experiments on measurement of
internal friction during heating of the samples to determined tempera-
tures above and below the temperature of the reverse transitions with
intermediate cooling to 78°K, as well as in a study of the frequency
dependence of internal friction. Orig. art. has: 3 figures.

SUB CODE: MM,IO/ SUBM DATE: 28Oct64/   ORIG REF: 010

OTH REF: 005

BVK

Card   2/2

GARBER, R.I.; PATSKO, O.I.

Internal friction during δ-γ transformation in iron. Part 2.
Fiz.-met. i metalloved. 20 no.5:749-752 N '65.

(MIRA 18:12)

1. Fiziko-tekhnicheskiy institut AN UkrSSR. Submitted July 28, 1964.

ACC NR: AP6033056   (A) SOURCE CODE: UR/0126/66/022/002/0310/0312

AUTHOR: Garber, R. I.; Malik, G. N.

ORG: Physicotechnical Institute AN SSSR (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: The effect of ultrasonic irradiation on the mechanical properties of copper

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 2, 1966, 310-312

TOPIC TAGS: ultrasonic radiation, mechanical property, copper, magnetostriction

ABSTRACT: The authors study cold hardening as a function of sound irradiation inten-
sity and the effect of cold hardening on subsequent recrystallization on commerically
pure copper tubes and deoxygenated copper rods 10 mm in diameter and 112 mm long. The
tubes were annealed and irradiated at high temperatures up to 900°C in a vacuum cham-
ber. The PMT-3 unit was used for measuring microhardness. The specimens were sub-
jected to torsional deformation and the angle of torsion was measured. The specimens
were irradiated by a magnetostriction transducer coupled to the specimen by a multi-
stage concentrator. The end of the specimen was clamped onto the thin part of the
concentrator by a locknut. The resonance frequency of the system was 17.6 kc with a
half-wave equal to the length of the specimen. Graphs are given showing microhardness
as a function of the distance from the end of the system. It is assumed that destruc-
tio   persion of the blocks and grains occurs during irradiation, increasing the

Card 1/2   UDC: 539.292; 548.0; 539.3

ACC NR: AP6033056

hardness and yield point. Graphs are also given for determining yield point variation in irradiated copper specimens. After sonic treatment the specimens are torqued up to a given point. Scratches were made by a corundum stylus along the generatrix of the cylindrical surfaces of the specimens both before loading and after load relief. The distance between these marks along the periphery was used to evaluate residual shear. An additional graph is given showing maximum yield point as a function of the amplitude of sonic irradiation. An increase in vibration amplitude strangthens the specimen although embrittlement or failure may occur at large amplitudes and ultrasonic irradiation doses. Orig. art. has: 5 figures, 1 formula.

SUB CODE: 11, 20/ SUBM DATE: 03Jul65/ ORIG REF: 004/ OTH REF: 001

Card 2/2

L 24131-66   EWT(1)/EWT(m)/T/EWP(t)   IJP(c)   JD/JG

ACC NR: AP6010970   SOURCE CODE: UR/0056/66/050/003/0520/0524

AUTHOR: Garber, R. I.; Afanas'yev, V. I.; Dranova, Zh. I.; Mikhaylov-
skiy, I. M.

ORG: Physicotechnical Institute, AN UkrSSR, (Fiziko-tekhnicheskiy
institut AN Ukrainskoy SSR)

TITLE: Low temperature recrystallization of tungsten microcrystals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50,
no. 3, 1966, 520-524

TOPIC TAGS: low temperature, recrystallization, crystal dislocation,
grain structure, microcrystal, tungsten deformation

ABSTRACT: Tungsten deformed at liquid nitrogen temperature has been
investigated in a field ion microscope after being kept at room tem-
perature. It is shown that new recrystallization centers may arise
at 600--700C in the deformed boundary region of the microcrystals.
The transverse size of the stable grain is 20--60Å at a disorienta-
tion angle of 8--10°. The dislocation structure of the boundaries was
discussed. Orig. art. has: 2 figures. [Based on author's abstract]
[NT]

SUB CODE: 20/   SUBM DATE: 06Aug65/   ORIG REF: 003/   OTH REF: 001

Card 1/1

L 36383-66   EWT(1)/EWT(m)/T/EWP(t)/ETI   IJP(c)   GG/JD

ACC NR: AP6014029   SOURCE CODE: UR/0056/66/050/004/0905/0910

AUTHOR: Boyko, V. S.; Garber, R. I.

ORG: Physicotechnical Institute, AN UkrSSR (Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR)

TITLE: Determination of phenomenological parameters of the dislocation theory of elastic twins in calcite

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 4, 1966, 905-910

TOPIC TAGS: crystal, crystal dislocation, surface tension, twinning, elastic twin

ABSTRACT: A method is proposed for determining the phenomenological parameters of the dislocation theory of the Peierls elastic twins and surface tension forces, based on a deformation diagram. The stress state of a band is calculated in the case corresponding to the deformation of a cylinder whose surface is subjected to forces directed in parallel to the generatrix and are constant along it under boundary conditions created in the experiment. For the first time it has been possible to retain the twin in the crystal by distributing the load. The Peierls' force was found to be 0.3--0.7 kg/cm^2 and the parameter M, characterizing the usrface tension, was 3 $kg/cm^3/_2$. From these quantities, the value of the surface energy of calcite can be

Card 1/2

L 36383-66

ACC NR: AP6014029   3

estimated as $\alpha \approx 10$ erg/cm^2. The authors are pleased to express their gratitude to
A. M. Kosevich and L. A. Pastur for their constant interest to this work and useful
consultations, and L. A. Krivenko for assistance in the experimentation. Orig. art.
has: 2 figures, 9 formulas, and 1 table. [Based on authors' abstract]   [NT]

SUB CODE: 20, 11/ SUBM DATE: 11Nov65/ ORIG REF: 014/ OTH REF: .001

Card 2/2

L 49379-66   ENT(1)/ENT(m)-2/T/ENA(b)   IJP(c)

ACC NR: AP0014163   SOURCE CODE: UR/0053/66/088/004/0751/0752

AUTHOR: Garber, R. I.

ORG: Physicotechnical Institute, AN UkrSSR, Khar'kov (Fiziko-tekhnicheskiy Institut
AN UkrSSR)

TITLE: Relaxation phenomena in solids [Fourth All-Union Scientific Conference, Voro-
nezh, 25-30 October 1965]

SOURCE: Uspekhi fizicheskikh nauk, v. 88, no. 4, 1966, 751-752

TOPIC TAGS: solid state physics conference, relaxation process, internal friction,
SOLID STATE PHYSICS

ABSTRACT: The conference was attended by more than 400 delegates from 40 cities of
the SSSR and some foreign governments, and its business was handled in plenary ses-
sions and seven sections, at which 270 papers and communications devoted to different
effects connected with relaxation phenomena in solids were delivered. Review papers
were delivered by V. S. Postnikov, G. V. Skrotskiy, G. P. Mikhaylov, G. M. Bartenev,
and others. The sections dealt with the theory of relaxation phenomena in solids,
mechanical-thermal relaxtion in metals, internal friction and dispersion of moduli of
elasticity of metals, alloys, and low-molecular compounds, electromagnetic relaxation
in solids, relaxation phenomena in high-molecular compounds, measurement procedures
and techniques, and instruments. Theoretical research reported at the conference
dealt with the theory of dielectric losses in polymers, dispersion of the dielectric
constant, spin-spin relaxation, ordering-parameter relaxation, paramagnetic absorption,
electron paramagnetic resonance, nuclear quadrupole resonance, spin-lattice absorp-

Card 1/2   UDC: 539.2

L 34479-66

ACC NR: AP6014163

tion, multipole-multipole interaction, thermal and diffusion relaxation, inelastic oscillations of dislocations and influence of point defects, relaxation in electro-magnetic circuits with ferromagnets, relaxation near the phase-transition temperature, internal friction and elastic relaxation of various media. A total of 40 theoretical papers were delivered. Most experimental papers were devoted to internal friction in metals and alloys over a wide range of temperatures and frequencies. Stress relaxa-tion, creep, and elastic aftereffect were also extensively reviewed. Various effects connected with internal friction are briefly listed. It is pointed out in conclusion that there is still a lack of comprehensive measurements of many properties and char-acteristics of the investigated objects.

SUB CODE: 20/   SUBM DATE: 00

Card 2/2

20128

2L1.7 -00   1143, 1157, 1035

S/181/61/003/002/026/050
B102/B212

AUTHORS: Garber, R. L. and Stepina, Ye. I.

TITLE: Defects at the boundary of twin layers

PERIODICAL: Fizika tverdogo tela, v. 3, no. 2, 1961, 514-519

TEXT: In order to investigate plastic deformations in twinning it is
necessary to study structure and properties of the boundary layer in a
twin crystal and parent crystal. It has already been investigated for
several times experimentally by using etch patterns and theoretically
by assuming that the boundary has a dislocation characteristic. In a
previous paper the author has already reported on investigations, which
he had done on a wedge-shaped twin. This paper reports on studies which
have been done to clear the nature of defects appearing at the boundaries
of twin and parent crystals. The investigations have been done on calcite
crystals which had been deformed by shearing and had also been etched
with a weak etching solution of type CP-4 (SR-4). Etch patterns have
been produced and observed under various conditions. Under a 340 times
magnification all etch patterns observed were similar, i.e., small oval

Card 1/2

20128

Defects at the boundary ....

S/181/61/003/002/026/050
B102/B212

openings which are arranged in rows. These results and those of the previous paper (DAN SSSR, 128, no.3, 499, 1959) make it possible to draw conclusions on the mechanism for defects to occur at boundary of twins. Similar assumptions are used with respect to the position of cleavage faces of a wedge-shaped twin, as used by K. V. Vladimirskiy. It has been found that etch patterns at the twin boundary would occur due to the presence of finest layers of untwinned material at these boundaries; the edges of these layers are bounded by twinning dislocations. During the fusion of the boundaries in a reciprocal twinning or in a twinning of a semisynthetic twin small islands of untwinned material with twinning dislocations at their edges will occur in the sample. At these places there are etch patterns which are similar to those observed at the boundary of twin layers. Clogged islands with dislocations can be re-moved by sufficiently high shear stresses ($1000 \ g/mm^2$) with corresponding signs. There are 5 figures and 9 references: 7 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR Khar'kov (Institute
of Physical Technology AS UkrSSR, Khar'kov)
SUBMITTED: May 24, 1960
Card 2/2

GARBER, R.S

DERBANDIKER, M. O.· TSIVELEVA, Ye. S.; TATARINOV, A. I.; SHAMANOVA, Ye. G.;
GARBER, R. S.

Compression-ointment therapy of eczema. Vest. vener., Moskva
no.5:39-40 Sept-Oct 1951.   (CLML 21:1)

1. Candidate Medical Sciences for the first; Departmental
Physician for the others. 2. Of the Department of Skin
and Venereal Diseases, Central Institute for the Advanced
Training of Physicians (Director — V. P. Lebedeva; Head
of Department — Prof. M. A. Rozentul) attached to the
Clinical Hospital imeni Korolenko of Moscow Municipal
Public Health Department (Head Physician — Docent V. P.
Volkov).

L 5147-66   EWT(1)/EWT(m)/EWP(t)/EWP(b)/ETC(m)   IJP(c)/RPL   JD/WW/JW/RM

ACCESSION NR: AP5021103   UR/0056/65/049/002/0429/0432

AUTHORS: Voronel', A. V.; Garber, S. R.; Simkina, A. P.;
Charkina, I. A.

TITLE: Specific heat of gadolinium near the Curie point

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49,
no. 2, 1965, 429-432

TOPIC TAGS: gadolinium, Curie point, specific heat, second order
phase transition

ABSTRACT: To check on the behavior of the logarithmic singularity of
the specific heat near a normal second order phase transition point,
for example, a ferromagnetic transition point, the authors measured
the specific heat of two gadolinium samples near the Curie point
(290K). The two samples (Gd_{12} and Gd_{27}) had resistivity ratios
$\rho(300K)/\rho(4.2K)$ of 12 and 27 respectively, and their weights were ~70
and ~1.2 g respectively. The measurements on Gd_{12} were made with

Card 1/4

L 5147-66
ACCESSION NR: AP5021103   /8

standard calorimetric apparatus, and that of Gd_{27} with a special
calorimeter shown in Fig. 1 of the Enclosure. Plots are given of the
specific heat against the temperature and against the relative tem-
perature difference. The effect of impurities on the singularity of
the thermodynamic potential at a second order transition point is dis-
cussed and it is shown that the presence of such a singularity is
masked by the imperfection of the samples. The incorrectness of the
determination of the Curie point from the maxima of nonmagnetic
properties is pointed out, and the discrepancies between the publish-
ed values of the Curie point, determined by using various properties,
are accounted for. 'We thank K. P. Belov, A. V. Ped'kov and R. Z.
Levitin for supplying the Gd_{27} gadolinium sample and for interest in
the work. We are grateful to G. V. Abramov and R. S. Aristov for
help with the measurements and V. A. Konoplev for help with construc-
ting the thermometer-heater used for the gadolinium sample.' Orig.
art. has: 3 figures

Card 2/4

L 5147-66
ACCESSION NR: AP5021103   3

ASSOCIATION: Institut fiziko-tekhnicheskikh i radiotekhnicheskikh
izmereniy (Institute of Physicotechnical and Radiotechnical
Measurements)

SUBMITTED: 10Mar65   ENCL: 01   SUB CODE: SS, TD

NR REF SOV: 005   OTHER: 002
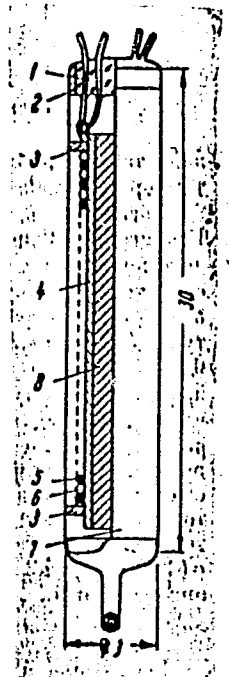
Card 3/4

L 5147-66

ACC NR: AP5021103   Enclosure: 01

Fig. 1. Diagram of calorimeter for Gd$_{27}$ sample

Legend: 1. Insulating beads
2. Platinum rim
3. Two paper washers
4. Cigarette paper
5. Copper wire
6. Thermometer-heater
7. Copper casing
8. Sample (glued to cigarette paper)

Card 4/4

GRABARCHUK, N.; GARBER, T.

Improving the control system on the two-motor clamshell winch of
the "Kaiar" gantry crane. Mor. flot 18 no.5:18 My '58. (MIRA 11:6)

1.Nachal'ni otdela mekhanizatsii Odesskogo porta (for Grabarchuk).
2.Starshiy inzhener-elektrik Odesskogo porta (for Garber).
                    (Cranes, derricks, etc.)

MEDVEDIK, S., inzh., aspirant; GARBER, T.

Methods of decreasing loads on clamshell cables of gantry cranes. Mor.
flot 19 no.1:5-9   Ja '59.   (MIRA 12:3)

1. TSentral'nyy nauchno-issledovatel'skiy institut morskogo flota (for
Medvedik). 2. Starshiy elektromekhanik Odesskogo Porta (for Garber).
                (Cables)   (Cranes, derricks, etc.)

TUMANOV, Ivan Lukich, GARBER, T.N., otv. red.; NADEINSKAYA, A.A., tekhn.red.;
    SABITOV, A., tekhn.red.

[Water and air supply in coal preparation and briquetting plants]
Vode-vozdushnoe khoziaistvo ugleobogatitel'nykh i briketnykh fabrik.
Izd.2., perer. i dop. Moskve, Ugletekhizdat, 1958. 199 p. (MIRA 11:9)
        (Coal preparation)

GARBER, V.I., inzhener.

Operation of sensitive anti-grounding systems in peat industry
electric substation lines. Elek.sta. 25 no.10:55 O '54.(MLRA 7:11)
     (Electric substations) (Electric currents--Grounding)

GARBER, V.I., inzhener; ZHUKOV, N.F., master.

Capacitors as a source of operating current. Elek.sta. 27 no.5:
58-59 My '56.   (MLRA 9:8)
                  (Electric engineering)

ARSEN'YEVA, N.P., inzh.; BYKOVA, S.P., inzh.; GARBER, V.I., inzh.

Relay-protection diagrams for operational alternating current. Elek.
sta. 28 no.12:76-78 D '57.   (MIRA 12:3)
                (Electric relays)

a, m   L 9793-66

ACC NR: AP5028539

SOURCE CODE: UR/0286/65/000/020/0140/0140

AUTHORS: Garber, V. M.; Kerbaliyev, A. I.; Kozak, M. M.; Matskin, L. A.; Petrov, V. P.; Rudoy, Yu. M.; Sil'verstrov, V. T.

ORG: none

TITLE: Automatic machine for packaging liquid products in cans with inserted or rolled lids. Class 81, No. 175867

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 20, 1965, 140

TOPIC TAGS: automation, storage device, lubricant

ABSTRACT: This Author Certificate presents an automatic machine for packaging liquid products in cans with inserted or rolled lids (for example, oils and lubricants), consisting of mechanisms for transporting and transferring cans, metering and filling of cans, interlocking and automation of the operations. To improve production, decrease working area, and eliminate individual drives for each automated transporting or synchronizing device, the machine is constructed as a single unit (see Fig. 1) with provisions for rolling or inserting lids from a lid bin, a labelling device with label magazine, and a common automated drive.

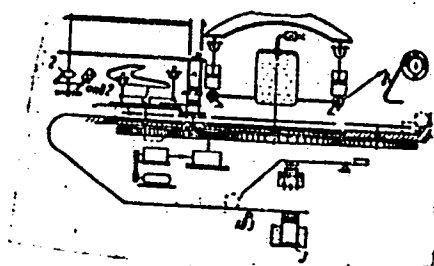UDC: 621.798.37 621.398.4 621.798.6

Card 1/2

ACC NR: AP5028539

Fig. 1. 1 - Device for rolling or inserting lids; 2 - magazine; 3 - labelling device.

Orig. art. has: 1 figure.

SUB CODE: 13/ SUBM DATE: 19Mar62/

Card 2/2

GARBER, Ye.A.; BILAS, L.M.

Treatment of intestinal toxicoses in infants. Pediatriia no.1:
33-34 '62.
(MIRA 15:1)

1. Drogobychskaya detskaya infektsionnaya bol'nitsa (glavnyy
vrach Ye.I. Meshalov).
(HYALURONIDASE) (INTESTINES--DISEASES) (INFANTS---DISEASES)

16.8000

38023 R
S/024/60/000/005/014/017
E140/E463

AUTHOR: Garber, Ye.D., (Leningrad)

TITLE: On a system for a stepping type optimizing control

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh
             nauk, Energetika i avtomatika, 1960, No.5, pp.169-173

TEXT: Control systems to obtain optimal dynamic properties are
complicated and have a large number of elements, therefore
permitting unreliability.   For a number of systems, such as ship
power sources, the dynamic properties are not of great interest.
The article therefore sets itself the task of finding simple and
economical control systems for optimization of certain parameters,
where the dynamic properties are not affected.   The basic
assumption is made that the controlled object has a single extreme
in a characteristic which is a function of a single argument.
It is noted that the results may be extended to the case of
functions of several controlled parameters (with a single extreme
value).   It is further assumed that the extremal characteristic
varies slowly and that the interval between operations of the
control system can be made long enough for all transient processes
Card 1/6

On a system for a stepping type ...   E140/E463

in the object to terminate.   The object is also required to be
stable with the optimizing control disconnected.   A well-known
proportional stepping type of optimizing control is shown in
Fig.1, where 1 is the controlled object,   2 is a measurement
device, 3, 4 are memories,   5 is a differential,   6 is an
amplifier,   7 the working step controller,   8 is the control
organ,   9 is the test controller,   10 is the clock generator,
$K_1 - K_5$ are normally closed switches,   T is the period for
establishing a new equilibrium position and T_0 is an optional
dead-time between working cycles, to reduce loss to unstationarity.
The search process for such a system is shown in Fig.2. M_n is the
initial point of the system, M'_n is reached at the end of t_1,
the system returns to M_n at the end of the time t_2 ,   and a new
steady position is reached at the end of t_3 , M_{n+1}.   The behaviour
of the system is described by the equation

$$x_{n+1} = x_n - k\left[y(x_n + \Delta) - y(x_n)\right] \text{ sign } \Delta \qquad (1)$$

It is assumed that the working step (t_3) is proportional to the
Card 2/6

On a system for a stepping type ...   S/024/60/000/005/014/017
E140/E463

change of the regulated parameter found in the test step (t_1).
A simplified version with two possible action cycles is shown in
Fig.3a,b.   Here 1 is the controlled object,   2 is a
measurement device,   3 an amplifier,   4 — the controller,
5 the regulating organ,   6 the test perturbation generator,
7 a clock generator, K_1, K_2 normally closed switches.   The
corresponding curves are given in Fig.4a,b and the equations by

$$x_{n+1} = x_n - k\left[y(x_n + \Delta) - y(x_{n+1})\right] \text{ sign } \Delta \qquad (2)$$

$$x_{n+1} = x_n - k\left[y(x_{n+1} + \Delta) - y(x_n)\right] \text{ sign } \Delta \qquad (3)$$

respectively.   Here again M_n is the initial point, M_n' the
position at the end of the test step, M_{n+1} the new stable
position.   The operating cycle of the simplified circuit has one
step less than the original circuit of Fig.1.   Further, the
magnitude of working steps in the circuit of Fig.1 on the right
branch of the characteristic will be smaller than that of Fig.3a,
Card 3/6

On a system for a stepping type ...   S/024/60/000/005/014/017
E140/E463

but larger than that of Fig.3b, and vice versa on the left branch.
For unsymmetrical extremal characteristic this gives the
possibility of selecting that variant which gives the greater rate
of approach to the optimal position.   Next the author considers
three possible applications in ship operation.
I. Maximum work for a given store of available energy, in which the
extremal control system should maintain optimal ratio between the
power output and the energy consumed.   An example would be to
find the ship velocity giving maximum distance, i.e. the
minimum fuel consumption for mile traversed.   The measuring
device must be a computer carrying out division of the magnitude
of power developed by the magnitude of energy consumed.
II. Obtaining the maximum power output for a given energy
consumption - maximum productivity.   An example would be
setting the main controller to obtain maximum ship velocity
for a given fuel consumption.   The measuring organ simply
determines the magnitude of output power.
III. Minimum fuel consumption for given output power-maintain
maximum economy.   An example would be setting of the main
Card 4/6

On a system for a stepping type ...   S/024/60/000/005/014/017
E140/E463

controller permitting minimum fuel consumption for a given ship velocity.   In this case a further simplification of the optimizing control can be found, as shown in Fig.5.   Here blocks 1 - 3 of Fig.3 are now represented by elements of the main controller: 1 is the controlled object (ship power source),   2 is the load regulator,   3 the fuel feed controller.
Finally, the author considers in general form the stability of the simplified system.   The linearized characteristic equation of the closed loop is found (it was assumed that the system is stable with open loop).   If the equation satisfies the usual stability criteria, it is shown that the search process in both systems of Fig.3 converge monotonically to a point close to the point of extremum.   It is understood that the minimum systems of Fig.3 can be extended, for example by the use of damping elements, the introduction of perturbation control to limit deviations from the extremal during fast manoeuvres, etc.   The simplest way of realizing the latter would be a device for disconnecting the optimizing control during the duration of the manoeuvre.   There are 5 figures and 2 Soviet references.

SUBMITTED: April 4, 1960
Card 5/6

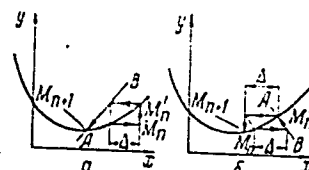On a system for a stepping type ...   S/024/60/000/005/014/017
Fig.1.   E140/E463

Fig.2.
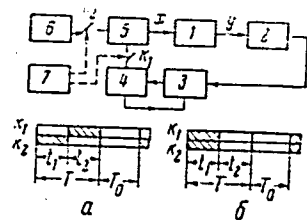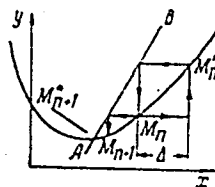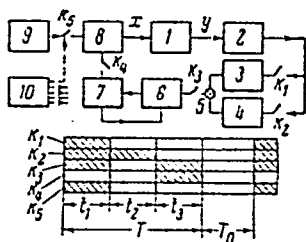
Фиг. 3

Fig.3.
Card 6/6   Fig.4.   Fig.5.
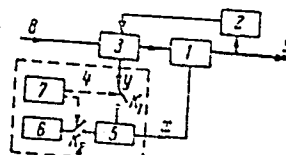
Фиг. 5. Эк-
жим подо-
регулятор
энергии, ·
орган пар;
7 — тактои

ZEROZHEK, Vladimir Vatslavovich[deceased]; Prinimali uchastiye:
SLUTSKIN, L.A., inzh.; FADEYEV, V.I., inzh.; SHIFRIN, M.Sh.,
doktor tekhn. nauk, prof., retsenzent; ANTONOVICH, S.A., kand.
tekhn. nauk, retsenzent; GARBER, Ye.D., nauchnyy red.; NIKITINA,
R.D., red.; KRYAKOVA, D.M., tekhn. red.

[Automatic control of ship systems]Avtomatika sudovykh sistem.
Leningrad, Sudpromgiz, 1962. 145 p.   (MIRA 15:10)
    (Marine engineering)   (Automatic control)

/ 6 ꞮꞮꞮꞮ

40532
S/044/62/000/008/064/073
C111/C333

AUTHOR: Garber, Ye. D.

TITLE: Dynamics of the extremal systems with modulating signal

PERIODICAL: Referativnyy zhurnal, Matematika, no. 8, 1962, 52,
            abstract 8V275. ("Izv. AN SSSR. Otd. tekhn. n.", 1961, no.4,
            153-162) Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh
                     nauk, Energetika i avtomatika, 1961, No 4. pp 153-162

TEXT: The output of the control interval y(x) be connected with
its input x by the given relation y = f(x). This output is multiplied
after a transition through a linear member with a periodic signal $F(\omega t)$
with the frequence ω. The obtained product comes into an integrating
element. The signal u resulting then is added to the periodic function
$\phi(\omega t)$ with the frequence ω, and this sum is led into the input of the
control distance. Under the supposition that the control interval is
inertialess (i. e. that the signal at its output appears at the same
time with the signal at the input) and that the linear member carries
out a differentiation, the system equations read as follows:

$$y = f(x), \quad \dot{u} = y\, F(\omega t), \quad x = u + \phi(\omega t) . \qquad (1)$$

It is shown that the system searches the extremum of the function f(x).

Card 1/2

Dynamics of the extremal systems with ... $\begin{array}{l} \text{S/044/62/000/008/064/073} \\ \text{C111/C333} \end{array}$

One considers the case where $\phi(\omega t) = \Delta\sin(\omega t + \varphi)$, $F(\omega t) = 0.5\,k$ $[1 + \text{sign} \times \sin \omega t]$, $y = a|x|$, $a > 0$, a, k, Δ, φ being constants. Then the system (1) can be strictly solved and one can determine values of Δ, k and φ such that the searching of the extremum is in a certain sense optimal. In case of the control element being subjected to inertia, the first equation of (1) is substituted by

$$T\dot{x} + x = u + \Delta \sin(\omega t + \varphi),$$

T being a given constant. In this case one cannot solve the equations (1) strictly; the author determines a stationary approximation solution, by setting $x = m + N \sin(\omega t + \nu)$ where m, N and ν do not explicitly depend on t. This kind of the solution supposes that the stationary periodic working process has the frequence ω. The obtained solution grants the possibility to determine the optimal characteristics of the system approximatively.

[Abstracter's note: Complete translation.]

Card 2/2

GARBER, Ye., D., inzh.

Optimalizing control system for marine boiler plants.
Sudostroenie 27 no.5:27-29 My '61.   (MIRA 14:6)
(Boilers, Marine)
(Automatic control)

S/024/62/000/004/006/007
E140/E435

/6,8000

AUTHOR: Garber, Ye.D. (Leningrad)

TITLE: Transient processes in optimizing systems (extremal systems) with modulating signal

TEXT: The transient processes in the presence of various forms of transient disturbance occurring in self-optimizing (extremal) automatic-control systems are examined employing a dependent search process with a periodic modulated signal applied to the input; the control signal is obtained by integration of the product of the output with a correlation signal at the same frequency.   The purpose is to obtain relationships facilitating the selection of the parameters of such systems.   An example of such a system is the pneumatic extremal control described by N. V. Grishko (Avtomatika i telemekhanika, v.22, no.5, 1961). In the present article the author considers the analysis of such

Card 1/2   # S/103/61/022/005/012/013

Transient processes ...

S/024/62/000/004/006/007
E140/E435

systems using the method of harmonic balance (method of
describing functions).   Various types of disturbances are
considered: disturbances corresponding to sudden changes of the
load or sudden changes of the type of fuel in thermal power
stations, disturbances due to slow drift in the extremal
characteristics of the object and to high-frequency noise
(especially serious when near the modulation frequency).
There are 2 figures.

SUBMITTED: November 1, 1961

Card 2/2

S/103/62/023/004/009/011
D299/D301

AUTHOR: Garber, Ye.D. (Leningrad)

TITLE: Linearization, by describing functions, of nonlinear aperiodic networks of automatic systems

PERIODICAL: Avtomatika i telemekhanika, v. 23, no. 4, 1962, 536 - 539

TEXT: Two methods of linearization are proposed: an exact method and an approximate one. The nonlinear elements have the equations of motion:

$$F(x, p, x, ..., p^n x, y, py, ... p^m y) = 0, \quad (1)$$

where x is the input parameter, y — the output parameter, p — the time-differentiation operator. By setting (in Eq. (1)):

$$x = A \sin \Omega t \quad (2)$$

and by determining the first harmonic $[y]_1$ of the output oscilla-tions, one obtains

Card 1/3

Linearization, by describing ...

$$y \approx [y]_1 = q\,A\,\sin\Omega t + q'A\,\cos\Omega t = qx + \frac{q'}{\Omega}\,px;\qquad(3)$$

$[y]_1$ can be determined by 2 methods; for various networks, Eq. (1) can be exactly integrated, after introducing (2). Thereupon one obtains the coefficients

$$q = \frac{1}{\pi A}\int_0^{2\pi} y(\Psi)\,\sin\Psi\,d\Psi, \quad q' = \frac{1}{\pi A}\int_0^{2\pi} y(\Psi)\,\cos\Psi\,d\Psi.\qquad(4)$$

If the solution is symmetrical, the integration can be performed over a half-period. The second method is approximate and its feasibility depends on the type of the nonlinear function F. By this method, the first harmonic of the left-hand side of Eq. (1) is set equal to zero, (after introducing Eqs. (2) and (3)). The coefficients q and q' are determined from a system of 2 equations which are (in general) nonlinear. This method can be used in 2 cases: a) Either the nonlinearity is weak or the lag element has filter property; b) The higher harmonics of y have little effect on the first harmonic of the left-hand side of Eq. (1), which amounts to a suf-

Card 2/3

Lincarization, by describing ...

S/103/62/023/004/009/011
D299/D301

ficiently smooth dependence of F on y and on its derivatives. At least one of these conditions are satisfied for various nonlinear aperiodic networks. Two typical examples are considered, involving hydraulic servomotors. In conclusion it is noted that the above method can be readily extended to nonsymmetrical-, and also to damped oscillations. There are 3 figures and 2 Soviet-bloc references.

SUBMITTED: July 31, 1961

Card 3/3

Garber, Ye. D.

AID Nr. 981-11   3 June

ERROR ESTIMATION OF THE HARMONIC BALANCE (EQUIVALENT LINEARIZATION) METHOD (USSR)

Garber, Ye. D.   Avtomatika i telemekhanika, v. 24, no. 4, 1963, 482-492.

S/103/63/024/004/006/014

The method of the harmonic balance is applied to the approximate determination of periodic states of forced oscillations in a nonlinear automatic control system described by equations

$$D(p) z + K(p) v + L(p) \varphi = 0,$$

(1)

$$v = f(z),$$

Card 1/2

AID Nr. 981-11   3 June

ERROR ESTIMATION [Cont'd]   S/103/63/024/004/006/014

where φ is a periodic disturbance function with frequency ω; D(p), K(p), and L(p) are operator polynomials; and f(z) and φ(t) are sufficiently smooth non-linear functions. The periodic solution of (1) is sought in the form of a first harmonic. It is shown that the harmonic balance method can be considered as the first approximation of Galerkin's method. The method of estimating the error of the solution obtained by the harmonic balance method is presented first for the nonresonance case (D(ijω) $\neq$ 0 for all j positive integers). An effective estimate of the solution by first approximation is derived in the case where the function f(z) satisfies Lipshitz's condition. It is shown that the error of the harmonic balance method is small when the linear part of the system has the property of a filter. Estimation of error is also carried out for the important practical case of D(0) = 0, where an effective estimate is derived by utilizing the displacement function. The method of estimating the error of the harmonic balance method is extended to the case where coefficients of equations (1) are periodic functions with frequency ω.   [LK]

Card 2/2

GARBER, Ye.D.; SAVITSKIY, V.I.; FILIMONOVA, I.T.

Initial-condition adjustment on on a pneumatic continuous computer.
Priborostroenie no.10:6-8 0 '63.   (MIRA 16:11)

GARBER, Ye.D., kand.tekhn.nauk; STEPANOV, G.A., inzh.

Investigating the automatic control system of a marine boiler
plant by means of an electronic model of the boiler. Sudostroenie
29 no.6:18-22 Je '63.   (MIRA 16:7)
        (Boilers, Marine) (Automatic control)
                             (Electronic analog computers)

GARBER, YE.D. (Leningrad):

"On the estimate of parameters for periodic regimes of non-linear automatic systems".

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 Jan - Feb 64.

GARBER, Ye.D., kand. tekhn. nauk; SOBOLEV, L.G., kand. tekhn. nauk; YUNG,
V.N., kand. tekhn. nauk

Extremum characteristics of marine boiler plants. Sudostroenie
30 no.9:19-21 S '64.   (MIRA 17:11)

L 41049-65   EPF(n)-2/EWT(d)/EWP(1)   Pg-4/Pk-4/Pl-4/Po-4/Pq-4/Pu-4/Pae-2   IJP(c)
WW/BC
ACCESSION NR: AP5006278   S/0103/65/026/002/0277/0287   52
                                                                          B

AUTHOR: Garber, Ye. D. (Leningrad); Rozenvasser, Ye. N. (Leningrad)

TITLE: Investigation of free periodic oscillations in nonlinear systems based on
. a filter hypothesis

SOURCE: Avtomatika i telemekhanika, v. 26, no. 2, 1965, 277-287

TOPIC TAGS: nonlinear automatic control, cycling, automatic control, automatic
control design, automatic control system, automatic control theory

ABSTRACT: Based on P. Sagirow's work (Z. angew. Math. und Mech.,
no. 10-11, 1960), the present article extends the use of the method of integral
equations. An evaluation of the error inherent to the harmonic-balance method
involves these two problems: (1) Finding a-priori estimates of the higher
harmonics of unknown free periodic oscillations and (2) Approximate determina-
tion of periodic-oscillation parameters. A rigorous method for solving the first

Card 1/2

L 41049-65
ACCESSION NR: AP5006278

problem in general form is suggested. An improved estimator for the case of

nonautonomous systems is given by: $|z - z_{np}| \leqslant \frac{\max |J_i|}{1 - MI}$ which is applicable if

$1 - MI > 0$. For autonomous systems, several estimators depending on initial
assumptions are derived. The second problem is solved by a simple approxima-
tion method which does not require solving variational problems. Only the case
of symmetrical periodic oscillations is considered. Orig. art. has: 4 figures
and 65 formulas.

ASSOCIATION: none

SUBMITTED: 01Oct63   ENCL: 00   SUB CODE: IE, DP

NO REF SOV: 009   OTHER: 002

Card 2/2

L 36979-66   EWP(k)/EWT(d)/EWP(h)/EWP(1)/EWP(v)   BC

ACC NR: AP6008526   SOURCE CODE: UR/0280/66/000/001/0110/0117

AUTHOR: Garber, Ye. D. (Leningrad)

ORG: none

TITLE: The calculation of stepwise automatic optimizers with dependent search

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 1, 1966, 110-117

TOPIC TAGS: optimal automatic control, automatic control theory, linear control system

ABSTRACT: Systems utilizing stepwise proportional extremal regulators with separate realization of sensing and executor motions (and a dependent extremum search) have been partially investigated for cases involving quadratic characteristics and specified types of the linear segment of the plant. However, as in the case of relay systems, the discrete character of the systems discussed allow the calculations of their operating conditions without neglecting the higher harmonics for an arbitrary order of the plant. Consequently, the author presents a more general investigation of the dynamics of certain stepwise proportional automatic optimization systems neglecting, however, the influence of perturbations. Following the formulation of the problem, the author studies inertialess systems, systems with inertia, and then applies the newly developed theory to the design of the

Card   1/2

L 36979-66

ACC NR: AP6008526

pneumatic optimizer of fuel consumption described by Yu. G. Stegalichev and
Ye. D. Garber (Byulleten' izobreteniy i tovarnykh znakov, 1963, no 11). Orig.
art. has: 40 formulas and 6 figures.

SUB CODE: 09,14/ SUBM DATE: 26Feb64/ ORIG REF: 012/ OTH REF: 000

Card   2/2

L 43830-66   EWT(d)/EWT(1)/EEC(k)-2/EWP(v)/EWP(k)/EWP(h)/EWP(1)   BC

ACC NR: AP6030618

SOURCE CODE: UR/0413/66/000/016/0109/0109

INVENTOR: Vedeshkin, A. A.; Garber, Ye. D.

ORG: none

TITLE: Pneumatic multiplier-divider. Class 42, No. 185116

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 16, 1966, 109

TOPIC TAGS: pneumatic device, pneumatic system

ABSTRACT: This Author Certificate introduces a pneumatic multiplier-divider containing a sawtooth generator and two pulse-width modulators. To reduce error, a
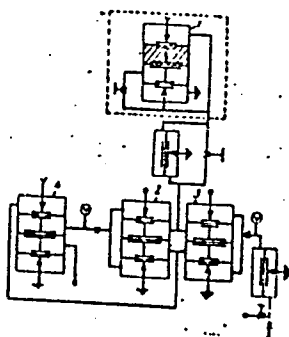
Fig. 1. Multiplier-divider

1 - Sawtooth generator; 2, 3 - pulse-width modulators; 4 - computer amplifier.

Card   1/2

UDC: 681.142.07-525

L 43880-66

ACC NR: AP6030618

O

computer amplifier is used whose input is coupled to the output of one of the pulse-width modulators and whose output is coupled to the input of both pulse-width modulators (see Fig. 1). Orig. art. has: 1 figure.

[JR]

SUB CODE: 13/ SUBM DATE: 14Jun65/ ATD PRESS: 5075

Card 2/2   blg

ACC NR: AP6015686   (A)   SOURCE CODE: UR/0413/66/000/009/0085/0085

INVENTOR: Garber, Ye. D.; Malov, B. P.; Stegalichev, Yu. G.; Skvortsov, Ye. I.

ORG: None

TITLE: A flowmeter. Class 42, No. 181320

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 9, 1966, 85

TOPIC TAGS: manometer, flow meter

ABSTRACT: This Author's Certificate introduces a flowmeter for liquids or gases which contains a differential manometer. The unit is designed for increased accuracy in flow measurement over a wide load range. The instrument contains a control unit and an actuating mechanism with a control element which has linear operating characteristics. The input of the control unit is connected to the differential manometer which measures the pressure drop across the control element. The output of the control unit is connected to the actuating mechanism of the control element.

Card 1/2

UDC: 621-531.3

ACC NR: AP6015686
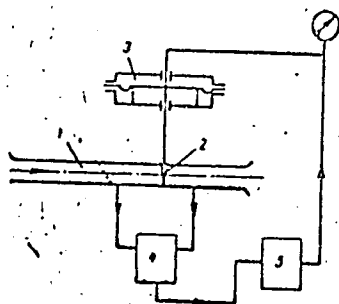
1—pipeline; 2—control element; 3—actuator; 4—differential manometer; 5—regulator

SUB CODE: 13/ SUBM DATE: 14Feb64

Card 2/2

ACC NR: AT6021738   (A)   SOURCE CODE: UR/0000/66/000/000/0153/0155

AUTHOR: Garber, Ye. D.; Stegalichev, Yu. G.

ORG: none

TITLE: Pneumatically operated fuel flow optimizer

SOURCE: AN SSSR. Institut avtomatiki i telemekhaniki. Pnevmoavtomatika (Pneumatic automation). Moscow, Izd-vo Nauka, 1966, 153-155

TOPIC TAGS: pneumatic device, fuel flow, flow regulator, optimal automatic control

ABSTRACT: Automatic optimization devices (extremum regulators) which select and maintain the most efficient conditions for giving a preset load must be used to raise the fuel economy of power plants (especially aboard ships). The parameter to be minimized is fuel flow per time unit to the plant. The static characteristics of power plants have the form

$$\mu_T = \lambda \ \alpha |\mu|,$$

where μ_T is the relative amount of fuel flow per time unit (the parameter to be minimized), λ is relative load size, μ is relative value of optimized parameter, and a is the proportionality factor. These characteristics of power plants differ in their slope (factor a lies between 0.03-0.10). Therefore fuel flow must be measured with

Card   1/2

ACC NR: AT6021738

great accuracy (not below 0.5%) and over a wide range (since λ changes within limits of 0 to 1). Various flow meters used in combination with general-purpose automatic optimizers do not give the required accuracy. In some cases, e.g., in boiler setups, the required accuracy may be achieved if the position of the regulating device in fuel flow is taken as the parameter to be minimized, but in internal combustion engines, for example, the position of the fuel stick describes only cyclic delivery of fuel, while multiplication of the corresponding magnitude by the engine rpm is inacceptable because of the great error. In such cases recourse must be had to direct discrete measurement of fuel flow over the time taken to empty a measuring vessel. The authors describe such a device using a pneumatically actuated diaphragm whose deflections measure flow rate. The device has two units, a level-meter and an optimizer. Laboratory tests of the device showed its workability and reliability. Its accuracy is 0.3%. Orig. art. has: 6 formulas and 2 figures.

SUB CODE: 13/ SUBM DATE: 03Feb66/ ORIG REF: 002

Card 2/2

ACC NR: AM6026323   ·   Monograph   UR/

Voytetskiy, Vitol'd Vitel'yevich; Garber, YEvgeniy Davidovich   :

Principles of automation and regulation of marine power plants (Osnovy
    avtomatizatsii i regulirovaniya sudovykh silovykh ustanovok)
    Leningrad, Izd-vo "Sudostroyeniye," 1966. 199 p. illus., biblio.
    7000 copies printed. Textbook for students and shipbuilding and
    marine technical institutes.

TOPIC TAGS: automatic control, automatic control technology, auto-
    matic regulation, automation, marine engineering, marine equipment,
    marine engine , POWER PLANT

PURPOSE AND COVERAGE: This book is designed as a textbook for students
    of shipbuilding and marine mechanics in technical schools; it can
    also be used by technical schools involved in the planning and
    operation of systems for the automatic control of marine power
    plants. The book discusses the principles of automatic regulation
    and control theory, describes typical marine automatic-equipment
    designs, and gives instructions for the installation, repair, and
    operation of marine regulating equipment, The present level of
    automation of steam, diesel, and gas-turbine power plants of
    domestic vessels is reflected, with the main attention being devoted
    to hydraulic and pneumatic means of regulation, which are more

Card 1/2   UDC: 629.12.02—52

ACC NR: AM6026323

widely used in these systems.   There are 10 references, all of which are Soviet.

TABLE OF CONTENTS [abridged]:

SUB CODE: 13/   SUBM DATE: 01Mar66/   ORIG REF: 010

Card 2/2

ACC NR: AP7008685   SOURCE CODE: UR/0020/67/172/005/1003/1006

AUTHOR: Garber, Ye. D.

ORG: none

TITLE: Concerning periodic solutions of certain nonlinear differential equations

SOURCE: AN SSSR. Doklady, v. 172, no. 5, 1967, 1003-1006

TOPIC TAGS: nonlinear differential equation, periodic solution, approximate solution

ABSTRACT: A method for obtaining more accurate estimates of periodic solutions of autonomous differential equations with one nonlinearity is given. A theorem is proved that shows the system

$$\frac{dx_k}{dt} = \sum_{i=1}^{n} a_{ki} x_i + b_k f(\sigma), \quad \sigma = \sum_{i=1}^{n} c_i x_i, \quad k = 1, 2, \ldots, n,$$

(where a_{ks}, b_k, c_s are real constants, the function $f(\sigma)$ is defined and continuous for all finite σ and $f(0) = 0$) has at least one nonzero symmetric periodic solution of the form

$$x_k(\psi) = \int_0^\pi R_k(\psi - \theta) f[a \sin\theta + z(\theta)] \, d\theta; \quad k = 1, 2, \ldots, n,$$

Card 1/2   UDC: 517.917

ACC NR: AP7008685

The theorem is applied to obtain estimates of the periodic solutions of the following three equations: The Van der. Pol equation

$$d^2x/dt^2 + x = \mu(x^2 - 1)dx/dt$$

the nonautonomous problem

$$d^2x/dt^2 + x + \mu\varphi(x, dx/dt, t) = 0,$$

and the equation

$$d^2x/dt^2 + x^3 = \sin t$$

Presented by Academician V. I. Smirnov on 12 April 1966. Orig. art. has: 10 formulas.

SUB CODE: 12/   SUBM DATE: 7Apr66/   ORIG REF: 006/   OTH REF: 002

Card 2/2

GARBER, YE. I.

PA 59/49118

USSR/Medicine - Central Nervous System   Mar/Apr 49
Medicine - Asphyxia

"Reaction of the Central Nervous System of the Frog in Asphyxia," Ye. I. Garber, Chair of Path Physiol, Mil Med Acad imeni S. M. Kirov, 5 pp

"Arkhiv Patologii" No 2

Shows that defunctionalization order of parts of the central nervous system of a frog, when asphyxiated, is the same as that of warm-blooded animals, and that the parts revive in reverse order. Heart stops after all parts of the central

59/49118

USSR/Medicine - Central (Contd)   Mar/Apr 49
Nervous System

nervous system cease to function. Checks length of time frog remained alive during asphyxiation at different temperatures, and agrees with Ober's data on tests made at 16° but records a longer period than Ober at 30° (15-25 min instead of 12 min). Shows that dysfunction of the medulla oblongata occurs not because of lack of oxygen but due to inhibitive effect on the hypothalamus caused by humoral defects. Submitted 13 Mar 47. Dir, Chair of Path Physiol * Prof I. R. Petrov, Col, Med Corps.

59/49118

GUBLER, Ye.V.; KOVALENKO, Ye.A.; VASADZE, G.Sh.; GARBER, Ye.I.

Recording conditioned and unconditioned respiratory reflexes by measuring pulmonary ventilation. Fiziol.zhur. 43 no.6:582-585 Je '57.

(MIRA 10:12)

1. Kafedra patologicheskoy fiziologii Voyenno-meditsinskoy ordena Lenina akademii im. S.M.Kirova.
    (RESPIRATION, physiol.
        recording method of reflexes by measurement of pulm.
        ventilation in dogs)
    (REFLEX
        same)

GARBER, Yo.I.

Technic for obraining quantitative records of conditioned and
unconditioned motor reflexes. Fiziol.zhur. 44 no.4:383-384 Ap '58.
                                                (MIRA 11:4)
1. Kafedra patologicheskoy fiziologii Voyenno-meditsinskoy ordena
Lenina akademii im. S.M.Kirova.
        (REFLEX, CONDITIONED, physiology
            quantitative recording of cond. motor reflexes,
            technic (Rus))
        (REFLEX, physiology
            unconditioned motor reflexes, quantitative recording
            technic (Rus))

GARBER, Ye.I., kand.med.nauk, podpolkovnik meditsinskoy sluzhby; KRASNITSKIY, V.S.

Experience in the use of electronic computers in the psycho-physiological selection of candidates for higher aviation schools. Voen.-med.zhur. no.1:67-71 '65.   (MIRA 18:10)

GARBER, Yu.I., inzh.

Fully mechanized construction of bituminous soil roadbeds.
Avt.dor. 23 no.7:6-7 Jl '60.   (MIRA 13:7)
        (Road construction) (Bitumen)

L 38301-65   EWT(m)/EWP(j)   Pc-4   RM
ACCESSION NR: AR5003331   S/0081/64/000/021/S050/S050

SOURCE: Ref. zh. Khimiya, Abs. 21S289

AUTHOR: Garber, Yu. I.

TITLE: Welding of polyvinylchloride masticated rubber by high-frequency currents

CITED SOURCE: Vestn. tekhn. i ekon. inform. N.-i. in-t tekhn.-ekon. issled. Gos.
kom-ta khim. prom-sti pri Gosplane SSSR, vyp. 3, 1964, 25-26

TOPIC TAGS: polyvinylchloride welding, masticated rubber welding, high frequency
welding, plastic welding, electric welding, weld seam stability

TRANSLATION: A method is described for the welding of polyvinylchloride masticated
rubber by currents with a frequency of 25-50 megacycles per second. The masticated
rubber is placed in an alternating current field between plate electrodes charged
with a high-frequency current. During welding of sheets having a large area, the
electrodes are placed parallel to each other only at the outer edges of the ma-
terial. Welding was accomplished by the use of LGD-1 and LGS-1.5 generators. Irons
with electrodes of varying shape served as the working instruments. The electrodes
were made from brass, which has good electrical conductivity and

Card 1/2

L 38301-65

ACCESSION NR: AR5003331   0

high resistance to wear. The electrode holders were made from Micalex or Fluoro-
plast-4. The irons were connected to the generators by means of a coaxial or
symmetrical cable. A coaxial line is more economical and safer to use. The
chemical stability of the weld seams obtained in acids, alkalies, salts and oxi-
dizing agents was equal to that of the basic material. The consumption of elec-
trical energy per running meter of weld seam during high-frequency welding was
0.06-0.1 kwh, compared to 1.2-1.5 kwh for the usual method with an air torch.
L. Reviznikov.

SUB CODE: MT, IE   ENCL: 00

Card 2/2

L 52096-65   EPF(c)/EPR/EWT(m)/EWP(j)/T/EWP(v)   Pc-4/Pr-4/Ps-4   RM/WW
ACCESSION NR: AP5015265   UR/0286/65/000/009/0047/0047

AUTHORS: Pakhomov, N. M.; Garber, Yu. I.; Gol'denberg, N. L.; Bret, T. V.   30

TITLE: A method for obtaining coatings. Class 22, No. 170597

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 9, 1965, 47

TOPIC TAGS: metal coating, concrete / arsamite, FR 12 cement

ABSTRACT: This Author Certificate presents a method for obtaining arsamite-based coatings on metallic or concrete surfaces. To improve the adhesion of the coatings to metal and concrete, arsamite is spread over a layer of cement FR-12.

ASSOCIATION: none

SUBMITTED: 27Jul63   ENCL: 00   SUB CODE: IE,MM

NO REF SOV: 000   OTHER: 000

FR-12=Plastic glue

Card 1/1

GARBER, YU

21749   GARBER, YU Pribory metallurgov. Ill. N. Pavlov I.K. Mikhaylenko
             Znaniye -- Sila, 1949, No. 6, S. 12-14.

             SO: Letopis'Zhurnal'nykh Statey, No. 29, Moskva, 1949

GARBER, Yu.

32521. Garber, Yu. Velikany sovetskoy industrii. (O domennom proizvodstve).
Znaniye --- sila, 1949, No. 9, s. 14-15.

SO: Letopis' Zhurnal'nykh Statey, Vol. 44

GARBER, Yu.I.

Welding polyvinyl chloride plastics with high-frequency current.
Mont. i spets. rab. v stroi. 26 no.8:16-18 Ag '64.
(MIRA 17:11)

1. Nauchno-issledovatel'skaya laboratoriya tresta Montazhkhim-
zashchita.

GARBER, Iu. N.

Dissertation: "Investigation of the Process of Obtaining the Naphthalene Fraction from Coal Tar." Cand Tech Sci, Dnepropetrovsk Metallurgical Institute, Dnepropetrovsk, 1953. (Referativnyy Zhurnal-Khimiya, No 12, Moscow, Jun 54)

SO: SUM 313, 23 Dec 1954

GARBER, Yu.N.

USSR/Chemistry - Physical chemistry

Card 1/1   Pub. 116 - 6/24

Authors   : Karavayev, N. M.; Zykov, D. D.; and Garber, Yu. N.

Title   : Study of phase equilibriums of a naphthalin-beta-methylnaphthalin system

Periodical   : Ukr. khim. zhur. 21/2, 176-181, 1955

Abstract   : The naphthalin-beta-methylnaphthalin system was investigated for the pur-
               pose of obtaining a high-temperature mixture especially suitable for the
               distillation of coal tar fractions. The phase equilibrium of the system
               and the mean enrichment coefficient were established. Both components of
               the system studied were found to be component parts of coal tar and by their
               boiling point occupy an intermediate position in the tar. The relation
               between the crystallization point and composition of the systems is ex-
               plained. Five USSR references (1941-1953). Table; graphs; drawing.

Institution : The I. V. Stalin Metallurgical Inst., Dnepropetrovsk, and the Moscow
               Inst. of Chem. Machine Building

Submitted   : November 26, 1953

Garber, Yu. N.

USSR/ Chemistry - Chemical technology

Card 1/1   Pub. 116 - 26/30

Authors   : Karavayev, N. M.; Zykov, D. D.; Garber, Yu. N.; Gumenyuk, T. D.; and
              Sandul, T. V.
Title   : Phase equilibriums of naphthalin with coal tar fractions

Periodical : Ukr. khim. zhur. 21/3, 410-415, June 1955

Abstract   : The phase conversions of naphthalin with various coal tar fractions was
              investigated on a laboratory rectification column to determine the effect
              of low boiling components (heavy fractions) on the phase equilibrium curve.
              The fact that coal tar and oil form a polyazeotropic mixture was taken into
              consideration and the results are evaluated. One USSR reference (1955).
              Tables; graphs.

Institution : The I. V. Stalin Metallurgical Inst., Dnepropetrovsk and the Inst. of
               Chem. Machine Constr., Moscow

Submitted   : December 24, 1953 and January 14, 1955

GARBER, Yu. N.

USSR/Chemical Technology. Chemical Products and Their I-13
        Application--Treatment of solid mineral fuels

Abs Jour: Ref Zhur-Khimiya, No 3, 1957, 9217

Author : Garber, Yu. N., Zykov, D. D., and Karavayev, N.M.
Inst   : Academy of Sciences USSR
Title   : Vapor Pressure of Coal Tar Fractions

Orig Pub: Izv. AN SSSR, Section on Technical Sciences, 1956,
          No 4, 101-105

Abstract: A method is described for determining the temper-
          ature dependence of the vapor pressure of various
          coal tar fractions. The coal tar fractions are
          treated as binary mixtures, one component being
          a substance, the temperature dependence of the
          vapor pressure of which is known and the other com-
          ponent being all the other substances boiling above
          or below the individual substance. A phase equil-
          ibrium curve is plotted on the basis of experimental
          data, and the average vapor pressure of the complex

Card 1/2

5 (3)
AUTHORS: Garber, Yu. N., Tarasova I. A.   SOV/153-2-2-12/31

TITLE: Phase-rule Equilibria in the System β-methyl Naphthalene
              Acenaphthene (Fazovyye ravnovesiya v sisteme β-metilnaftalin-
              -atsenaften)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya
              tekhnologiya, 1959, Vol 2, Nr 2, pp 207 - 209 (USSR)

ABSTRACT: The authors already gave information (Refs 1,2) on the phase-
              -rule equilibria in systems of several substances of various
              fractions of coal tar. Isolation conditions of several im-
              portant substances were given, as well as a new method of de-
              fining the average elasticity of vapors of compound mixtures
              by means of the curves of the phase-rule equilibria (Ref 3).
              The results made it possible to explain the isolation condi-
              tions of methyl naphthalene and acenaphthene through the frac-
              tion 220 - 285° (Ref 4) of which they are the main components.
              In recent times acenaphthene gained importance as raw material
              for producing synthetic substances. The dependence of the melt-
              ing temperature upon the composition, was found for the two
              products mentioned in the title. 8 mixtures were produced, con-
Card 1/4

Phase-rule Equilibria in the System β-methyl   SOV/153-2-2-12/31
Naphthalene Acenaphthene

taining β-methyl naphthalene of 18-95% by weight. The results
are shown in table 1 and figure 1. Figure 1 shows that the
mentioned mixture is of eutectic character. The curve of the
phase-rule equilibria was found by means of the apparatus
MIKhM (Refs 1,5). For this purpose 10 mixtures were produced
with a β-methyl naphthalene content of 16.9 - 90.0% by weight.
For the results see table 2. The mentioned curve for ideal
mixtures, one of which is the system studied here, has the
shape of an equilateral hyperbola in an isothermal process, ex-
pressed by the equation $\frac{Y}{1-Y} = K \frac{X}{1-X}$, with Y being the

content of the low-boiling compound in the steam phase, in mol
portions; X - the same in the liquid phase; K - a concentra-

tion coefficient ($= \frac{P_a}{P_b}$ i.e. the relation of steam tensions of

pure, low-boiling and high-boiling components at a certain tem-
perature). The curve found differs considerably from the men-
tioned hyperbola, since the examination usually does not take
place at a constant temperature (isothermal), but under a cer-

Card 2/4

Phase-rule Equilibria in the System β-methyl   SOV/153-2-2-12/31
Naphthalene Acenaphthene

tain pressure (isobar). Under these conditions, a special boil-
ing temperature corresponds to each composition and a special
concentration coefficient corresponds to that temperature. This
however changes little. Thus the isobar curve differs but
slightly from the isothermal curve. In order to derive the curve
of the phase-rule equilibrium of the isobar process, one has to
know the average concentration coefficient. It was computed ac-
cording to the method of the smallest square and amounted to
1.75. The curve mentioned last, was computed from the equation
of the hyperbola with 1.75 set in (Fig 2). From this curve the
number of theoretical trays of laboratory rectification columns
can be determined (Refs 6,7). The mixture mentioned in the ti-
tle may be useful for defining the number of half-boiling and
high-boiling fractions of coal tar. There are 2 figures, 2 ta-
bles, and 7 Soviet references.

ASSOCIATION: Dnepropetrovskiy metallurgicheskiy institut; Kafedra khimi-
                cheskoy tekhnologii topliva (Dnepropetrovsk Metallurgical
                Institute; Chair of Chemical Fuel Technology)

28 (4)

AUTHORS: Garber, Yu. N., Zelenevskaya, S. I.   S/032/60/026/01/043/052
                                                       B010/B009

TITLE: Production of Low Temperatures in the Heads of Laboratory
              Rectifying Columns

PERIODICAL: Zavodskaya laboratoriya, 1960, Vol 26, Nr 1, p 116 (USSR)

ABSTRACT: At the present institute a special assembly (Figure) for the
              production of low temperatures in the heads, i.e. the condensers,
              of rectifying columns has been designed. Liquid nitrogen is con-
              ducted from a Dewar vessel into a vaporizer. The latter is a
              bulb reflux condenser where the nitrogen vaporizes in the bulbs.
              The cooling mantle contains a calcium chloride solution, which
              is thus cooled and in turn cools the reflux condenser of the
              column and the outlet pipe (of the rectifying column) for the
              condensate. The calcium chloride solution is kept circulating
              by means of a circulation pump in the calcium chloride container.
              An M-72 motorcycle pump may be used (with slight modifications).
              The assembly described can produce temperatures down to -30°.
              There is 1 figure.

Card 1/2

Card 2/2

5.3300

78231
SOV/80-33-3-32/47

AUTHORS: Garber, Yu. N., Zelenevskaya, S. I., Rabukhina, G. G.

TITLE: Concerning the Azeotropic Rectification for the Separation of Isomers With Close Boiling Points (System m-Xylene-p-Xylene)

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 3, pp 694-700 (USSR)

ABSTRACT: The investigation of the phase equilibrium as well as the rectification of paraldehyde-m-xylene and paraldehyde--p-xylene systems showed that paraldehyde does not form azeotropes with either of the xylene isomers, and therefore cannot be used for the separation of the xylene isomers mixture. Similar study of 1,2-ethyl dibromide mixtures with xylene isomers showed that the former gives an azeotrope with p-xylene only. The azeotrope contains 92.5-95.0 molar % of 1,2-ethyl dibromide and its boiling point is 131.0° C. However, due to the low p-xylene content in the mixture of the

Card 1/2

GARBER, Yu.N.; RABUKHINA, G.G.

Liquid - vapor equilibrium in the system isomeric cresols - ethyl benzoate. Zhur. prikl. khim. 33 no.12:2782-2783 D '60.

(MIRA 14:1)

1. Dnepropetrovskiy metallurgicheskiy institut.
        (Cresol)   (Benzoic acid)

GARBER, Yu.N., kand.tekhn;nauk

Prospects for the use of azeotropic rectification in the by-product coke industry. Koks i khim. no.1:49-52 '61.   (MIRA 14:1)

1. Kuznetskiy filial Vostochnogo uglekhimicheskogo instituta.
            (Distillation, Fractional)
            (Coke industry—By-products)

S/068/61/000/012/002/002
E071/E435

AUTHORS: Garber, Yu.N., Candidate of Technical Sciences and
             Zelenevskaya, S.I.

TITLE: Vapour pressure of light, phenol, naphthalene and
             absorption oil (creosote oil) fractions of coal tar

PERIODICAL: Koks i khimiya, no.12, 1961, 51-54

TEXT: The dependence of vapour pressure on temperature for
typical fractions obtained on usual industrial installations for
the continuous distillation of coal tar was determined by the
method of phase equilibria, which were determined on a single
evaporation apparatus of the МИХМа (MIKhMa) type, previously
described (Ref.3: N.M.Karavayev, D.D.Zykov, N.B.Kondukov,
Zavodskaya laboratoriya, 1955, no.2, p.245).   From the
experimental data the enrichment coefficient K and coefficients
A and B for the equations characterizing the relationship
between vapour pressure and temperature were calculated.   The
following equations are valid:

$$\lg P = \frac{K}{T} + B$$

Card 1/3   (3)

Vapour pressure of light ...

S/068/61/000/012/002/002
E071/E435

and

$$\lg P = -\frac{0.05223}{T} A + B \qquad (4)$$

where P - vapour pressure,   K - enrichment coefficient,
A and B - constants characteristic for a given fraction.
The values of the constants are as follows:

Table 2

Fraction	Mean coefficient of enrichment (K)	Coefficient for Eq.(4)	
		A	B
Absorption oil	3.13	45053.41	7.1803
Phenol oil	1.89	44369.04	7.8721
Light fraction	14.07	55185.33	10.0083

Card 2/3

GARBER, Yu.N.; ZELENEVSKAYA, S.I.

Relationship between the index of refraction and the
composition of some binary systems. Zhur.fiz.khim. 35
no.9:2114-2115 '61.

(Systems (Chemistry))   (MIRA 14:10)
(Refraction)

KATSOBASHVILI, Ya.R.; GARBER, Yu.N.; EL'BERT, E.I.; BELENKO, Z.G.;
    Prinimal uchastiye SMIRNOV, V.K., laborant

Hydrocracking of high boiling fractions of coal tar in a
catalyst stationary bed under the pressure of 30 atoms.
Koks i khim. no.10:48-52 O '61.   (MIRA 15:1)

1. Institut neftekhimicheskogo sinteza AN SSSR (for Katsobashvili).
2. Kuznetskiy filial Vostochnogo uglekhimicheskogo instituta
(for Garber, El'bert, Belenko).
                    (Cracking process)
                      (Coal tar)

NOSKOV, V.V.; GARBER, Yu.N.

Using the method of high-frequency titration for the analysis of the products of coke and coal chemicals plants. Koks i khim. no. 8:49-54 '62.

(MIRA 17:2)

1. Kuznetskiy filial Vostochnogo uglekhimicheskogo instituta.

GARBER, Yu.N.; BOVKUN, R.A.; YEFIMOVA, Ye.N.

Liquid-vapor equilibrium in the system isobutyl alcohol -
isomeric xylenes. Zhur.prikl.khim. 35 no.2:416-422 F '62.
(MIRA 15:2)

1. Kuznetskiy filial Vostochnogo nauchno-issledovatel'skogo
uglekhimicheskogo instituta.
(Isobutyl alcohol)   (Xylene)   (Phase rule and equilibrium)

S/068/63/000/003/001/003
E071/E136

AUTHORS: Garber, Yu.N., and Yuferova, N.A.

TITLE: The absorptive capacity of oils used for the absorption
             of benzole hydrocarbons

PERIODICAL: Koks i khimiya, no.3, 1963, 35-37

TEXT: A method of evaluating the absorptive capacity of oils
used for the absorption of benzole hydrocarbons in the coking
industry is proposed. The amount of benzene adsorbed per hour at a
difference of its partial pressure of 1 mm, is taken as a criterion
of the absorptive capacity. Thus the amount of absorbed benzene is
related to the whole contact area of a standard laboratory absorber.
This criterion is supplemented by the amount of the oil's fraction
distilling up to 230 °C. The determination is done by passing a
known volume of purified coke oven gas, to which a known volume of
gaseous benzene is added, through a laboratory absorber filled with
the oil investigated. The absorbed benzene is distilled off using
a standard laboratory rectification column, weighed and recalculated
for a difference of partial pressures of 1 mm. The formula used is

Card 1/2 $A = Q/\Delta P_{mean}$

The absorptive capacity of oils ...   S/068/63/000/003/001/003
E071/E136

where: A - absorption capacity of oil, g.hr/mm; Q - the amount of absorbed benzene, g/hr; $\Delta_{P_{mean}}$ - mean logarithmic difference of partial pressures, mm Hg;

$$\Delta_{P_{mean}} = \frac{\Delta_{P_1} - \Delta_{P_2}}{2.303 \log \frac{\Delta_{P_1}}{P_2}} \; ; \quad \text{where} \quad \Delta_{P_1} = P_1 - P_2' \; ;$$

$\Delta_{P_2} = P_2 - P_1'$; where: P_1 - partial pressure of benzene in the gas entering the absorber; P_2 - the same, leaving the absorber; P_1' - vapour pressure of benzene vapour over oil leaving the absorber; P_2' - the same entering the absorber. Experimental data determined by this method are given for a number of fresh and used oils.   There are 1 figure and 2 tables.

ASSOCIATION: Kuznetskiy filial VUKhINa
              (Kuznetsk Branch of VUKhIN)

Card 2/2

KURGUZKIN, V.P.; GARBER, Yu.N.

Automatic analyzer of the TBP for the separation of given fractions in rectification columns with periodic action. Koks i khim. no.7:50-53 '63.   (MIRA 16:8)

1. Kuznetskiy filial Vostochnogo uglekhimicheskogo instituta (for Kurguzkin). 2. Altayskiy politekhnicheskiy institut (for Garber).
            (Distillation, Fractional)   (Boiling points)

GARBER, Yu.N.; ZELENEVSKAYA, S.I.

Azeotropic system n-hexane - benzene. Zhur. prikl. khim. 36
no. 10:2306-2308 O '63.   (MIRA 17:1)

GARBER, Yu.N.; BOVKUN, R.A.

Study of azeotropes formed by xylene isomers and styrene with
methylcellosolve. Zhur. prikl. kh m. 37 no. 4:831-837 Ap '64.
(MIRA 17:5)

GARBER, Yu.N.; BOVKUN, R.A.; Prinimala uchastiye BESSONOVA, Z.

Relation between the refractive index and the composition of binary systems formed by some alcohols with styrene and xylenes. Zhur.fiz. khim. 37 no.7:1581-1583 Jl '63.   (MIRA 17:2)

1. Vostochnyy nauchno-issledovatel'skiy uglekhimicheskiy institut, Kuznetskiy filial.